

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

Ex parte ROGER SANDSTROM

Appeal No. 2004-1341  
Application No. 09/806,220

ON BRIEF

MAILED

JUL 02 2004

U.S. PATENT AND TRADEMARK OFFICE  
BOARD OF PATENT APPEALS  
AND INTERFERENCES

Before MCQUADE, NASE, and BAHR, Administrative Patent Judges.  
MCQUADE, Administrative Patent Judge.

DECISION ON APPEAL

Roger Sandstrom appeals from the final rejection (mailed September 15, 2003) of claims 1 through 4, all of the claims pending in the application.

THE INVENTION

The invention relates to "a thread coupling for a drill string for percussive rock drilling" (specification, page 1).

Representative claim 1 reads as follows:

1. Thread coupling for a drill string for percussive rock drilling comprising a male thread (5) and a female thread (4) cooperating therewith, said male thread being arranged on a first drill string element (3) and said female thread being arranged on a second drill string element (2), that said first drill string element (3) has a first impact surface (6) and that said second

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drill string element (2) has a second impact surface (7), said first and second impact surfaces being arranged to abut against each other, characterized in that said male thread (5) and said female thread (4) are conical and that the crests (8) of said male thread (5) have a radius of curvature which is larger than 30% of the pitch of the thread.

#### THE PRIOR ART

The references relied on by the examiner to support the final rejection are:

Jansson et al. (Jansson)	4,760,887	Aug. 02, 1988
Yao	6,196,598	Mar. 06, 2001
Manten, German Patent Document <sup>1</sup>	1 170 887	May 27, 1964

#### THE REJECTIONS

Claim 1 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Manten in view of Jansson.

Claims 2 through 4 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Manten in view of Jansson and Yao.

Attention is directed to the main and reply briefs (filed January 20, 2004 and March 15, 2004, respectively) and to the answer (mailed February 19, 2004) for the respective positions of

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<sup>1</sup> The record contains an English language translation of this reference submitted by the appellant on June 9, 2003.

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the appellant and examiner regarding the merits of these rejections.<sup>2</sup>

#### DISCUSSION

Manten, the examiner's primary reference, discloses a drill string for use with a rotary impact drilling machine. The string comprises adjacent drill tubes 1 and 2 joined by a connection piece 3 having two male threaded collars 3a and 3b which engage female threaded portions on the opposing ends of the drill tubes. Manten teaches that the threads should be conical, as opposed to cylindrical or round, to achieve superior results in terms of wear resistance, breakage prevention and ease of assembly and disassembly.

As conceded by the examiner (see page 3 in the answer), Manten does not respond to the limitation in claim 1 requiring the crests of the male thread to have a radius of curvature which is larger than 30% of the pitch of the thread. To overcome this deficiency, the examiner takes two approaches.

In the first approach, the examiner looks to Jansson's disclosure of a percussion drill string comprising adjacent drill

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<sup>2</sup> The final rejection contains a number of additional § 103(a) rejections which have since been withdrawn by the examiner (see pages 4 and 5 in the answer and page 2 in the reply brief).

rods 10 and 11 joined by a coupling sleeve 12 having female threads which engage male threads on the opposing ends of the drill rods. The threads are cylindrical or round in shape and are particularly dimensioned to enhance wear life and to facilitate unscrewing. Thread pitch and top (i.e., crest) radius of curvature are among several interrelated parameters of concern to Jansson. The particular dimensions mentioned for each (see Jansson at column 2, lines 10 through 16; and column 3, lines 28 through 42) encompass male threads having a crest radius of curvature which is larger than 30% of the pitch of the thread. The examiner contends that it would have been obvious

to have formed the threads of [Manten] so that they are characterized in that they had crests having a radius of curvature that was greater than 30% of the pitch of the threads as taught by Jansson . . . in order to have achieved a threaded coupling that has a long life span and good unscrewing characteristics [answer, pages 3 and 4].

In the second approach, the examiner, citing In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980), submits that it would have been obvious, presumably in view of the teachings of Jansson,

to have formed the threads of [Manten] so that they are characterized in that they had crests having a radius of curvature that was greater than 30% of the pitch of the threads, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art [answer, page 4].

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As indicated above, Manten expressly teaches away from cylindrical or round drill string threads in favor of conical drill string threads. Jansson teaches cylindrical or round drill string threads having a number of specifically dimensioned and interrelated parameters including pitch and crest radius of curvature. Given the divergent natures of these teachings, the only suggestion for selectively combining Manten's conical thread with the particular pitch and crest radius of curvature dimensions of Jansson's cylindrical or round thread stems from hindsight knowledge impermissibly derived from the appellant's disclosure. Furthermore, the combined teachings of these references provide little, if any, factual support for the examiner's determination that the pitch and crest radius of curvature of Manten's conical thread are result effective variables whose optimization would have been within the skill of the art.

Accordingly, we shall not sustain the standing 35 U.S.C. § 103(a) rejection of claim 1 as being unpatentable over Manten in view of Jansson.

As the examiner's application of Yao does not cure the above noted shortcomings of Manten and Jansson relative to the subject matter recited in parent claim 1, we also shall not sustain the

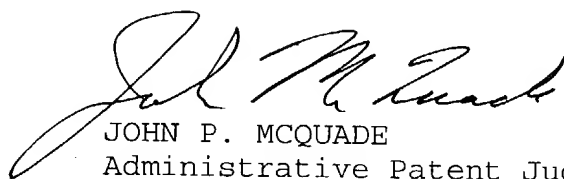
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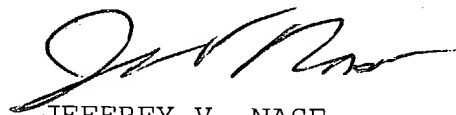
standing 35 U.S.C. § 103(a) rejection of dependent claims 2  
through 4 as being unpatentable over Manten in view of Jansson  
and Yao.

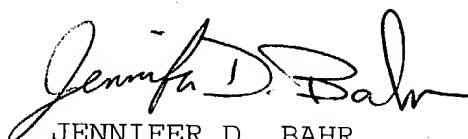
SUMMARY

The decision of the examiner to reject claims 1 through 4 is  
reversed.

REVERSED

  
JOHN P. MCQUADE  
Administrative Patent Judge

  
JEFFREY V. NASE  
Administrative Patent Judge

  
JENNIFER D. BAHR  
Administrative Patent Judge

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